IDAPA 37
TITLE 03
CHAPTER 09

37.03.09 - WELL CONSTRUCTION STANDARDS RULES

000. LEGAL AUTHORITY (RULE 0).
The Idaho Water Resource Board adopts these Well Construction Rules pursuant to the authority provided by Section 42-238(4), Idaho Code. ()

001. TITLE AND SCOPE (RULE 1).

01. Title. These rules shall be cited as IDAPA 37.03.09, "Well Construction Standards Rules." ()

02. Scope. The Idaho Department of Water Resources is responsible for the statewide administration of the rules governing Well Construction. The rules establish minimum standards for the construction of new wells, the construction of low-temperature geothermal resource wells, and the modification and abandonment of existing wells. The intent of the rules is to protect the ground water resources of the state against waste and contamination. The rules are applicable to all water wells, monitoring wells, low temperature geothermal wells, injection wells and other artificial openings, excavations, or improvements in the ground that are more than eighteen (18) feet in vertical depth below land surface. The intent of the rules shall be observed for any hole constructed, modified, or improved, regardless of depth, that could promote waste and contamination of the ground water resources of the state. ()

002. WRITTEN INTERPRETATION (RULE 2).
In accordance with Section 67-5201(19)(b)(iv), Idaho Code, the Idaho Department of Water Resources does not have written statements that pertain to the interpretation of the rules of this chapter, or to the documentation of compliance with the rules of this chapter. ()

003. ADMINISTRATIVE APPEALS (RULE 3).
Persons may be entitled to appeal agency actions authorized under these rules pursuant to 42-1701A, Idaho Code, and IDAPA 37.01.01, "Rules of Procedure of the Idaho Department of Water Resources". ()

004. INCORPORATION BY REFERENCE (RULE 4).

005. OFFICE HOURS -- MAILING ADDRESS AND STREET ADDRESS (RULE 5).

01. Office Hours. Office hours are 8 a.m. to 5 p.m. local time, Monday through Friday, except holidays designated by the State of Idaho. ()

02. Mailing Address. The mailing address for the state office is
Idaho Department of Water Resources,
P.0. Box 83720,
Boise, Idaho 83720-0098 ()

03. Street Address. The street addresses for the state office of the Department of Water Resources, the regional offices in Idaho Falls, Coeur d'Alene, Twin Falls, and Boise, and the satellite offices in Salmon, and Soda Springs may be obtained by calling the state office at (208) 287-4800, or by visiting the Department's website at http://www.idwr.idaho.gov. ()

006. PUBLIC RECORDS ACT COMPLIANCE (RULE 6).
Records maintained by the Department of Water Resources are subject to the provisions of the Idaho Public Records Act, Title 3, Chapter 3, Idaho Code. ()

007. OTHER AUTHORITIES REMAIN APPLICABLE (RULE 7).
Nothing in these rules shall limit the Director's authority to take additional or alternative actions in order to ensure compliance consistent with the intent of these rules as provided by Idaho law. ()

008. -- 009. (RESERVED).

010. DEFINITIONS (RULE 10).
Unless the context otherwise requires, the following definitions govern these rules: ()

01. Abandoned Well (also Decommissioned Well). Any well which has been permanently removed from service by filling and/or plugging in accordance with these rules so that it is rendered unproductive, does not allow the transfer of fluids, and will not serve as a conduit for waste and contamination of the ground water resources. ()

02. Abandonment (also Decommissioning). The act of filling or plugging of a well so that the well will not: a) produce or accept fluids, b) serve as a conduit for the movement of contaminants, and c) allow the movement of surface or ground water into unsaturated intervals, into another aquifer, or between aquifers~~, and d) allow the movement of water within the annular space or into an aquifer~~. ()

03. Annular Seal. Approved seal material installed in a manner that completely fills the annular space between the borehole and permanent casing or between separate casing strings to act as a low-permeability barrier ~~to~~ and prevent the horizontal and vertical movement of fluids. Annular seals create low-permeability barriers between the land surface and subsurface intervals, or between distinct subsurface intervals, and are critical to the prevention of waste and contamination of the ground water resources. In some cases, an annular seal may extend upward and become continuous with the surface seal. ()

04. Annular Space. The space between two (2) concentric cylindrical objects, one (1) of which surrounds the other, such as the space between the walls of a drilled hole (well bore) and a casing or the space between separate casing strings. ()

05. Aquifer. Any subsurface geologic interval, or hydraulically connected intervals, capable of storing and transmitting water to a well in sufficient quantities to make the production of water from such interval(s) feasible for beneficial use. The term does not include confining layers (low permeability intervals separating aquifers). ()

06. Area of Drilling Concern. Any area so designated by the Director in accordance with Section 42-238(15), Idaho Code. ()

07. Artesian Ground Water. Any water within an aquifer confined by low permeability intervals and under pressure so that the water will rise within the well above the top of aquifer. Artesian ground water includes water that rises to and flows naturally at the land surface. ()

08. Artificial Filter Pack (also Filter Pack). Clean, rounded, smooth, uniform, graded sand or gravel insert placed between the borehole wall and perforated well casing or well screen. A filter pack is used to prevent the movement of sand and sediment into the well and to enhance the ability of the well to yield water. ()

09. Bentonite. Low permeability sodium montmorillonite clay approved by the National Sanitation Foundation (NSF) for use in well construction, sealing, plugging, and abandonment. ()

a) **Bentonite Chips**. Bentonite composed of pieces from 3/8-inch to 1 inch on their greatest dimension, and containing less than 2% by weight fines or powder. ()

b) **Bentonite Granules (also Granulated Bentonite)**. Bentonite composed of pieces less than 3/8-inch on their greatest dimension but retained on a #8 standard sieve, and containing less than 2% by weight fines or powder. ()

c) **Bentonite Grout**. A mixture of bentonite and potable water to produce a slurry with a solids content not less than 25% by weight (25% solids content by weight = 50 pounds bentonite per 18 gallons of water). ()

d) **Bentonite Pellets**. Bentonite manufactured for a specific purpose in the form of compressed and/or coated pellets of various size. ()

10. **Board**. The Idaho Water Resource Board. ()

11. **Bore Diameter**. The diameter of the subsurface borehole ~~in the formation~~ made ~~by~~ during the well drilling process. ()

12. **Borehole** (also Well Bore). The subsurface hole created ~~caused by~~ during the well drilling process. ()

13. **Bottom Hole Temperature**. The temperature of the ground water encountered ~~in~~ at or near the bottom of a well. ()

14. **Casing**. A conduit of pipe used to: a) prevent caving and/or collapse of the borehole, b) serve as access and protective housing for pumping equipment, c) provide a vertical pathway for the upward flow of water, d) serve as a solid inner barrier to allow for the installation of an annular seal, and e) serve in conjunction with annular seals as a means to prevent waste and contamination of the ground water resources. Casing does not include screens, perforated sections, or liners used in the construction of the well. ()

15. **Cathodic Protection Well**. Any artificial excavation in excess of eighteen (18) feet in vertical depth constructed for the purpose of protecting certain metallic equipment in contact with the ground. Commonly referred to as cathodic protection. ()

16. **Closed Loop Heat Exchange Well**. A ground source thermal exchange well constructed for the purpose of installing any underground system through which fluids are circulated but remain isolated from contact with the subsurface. ()

17. **Competent Unit**. Subsurface earth materials that are sufficiently hard and durable to sustain an open borehole without caving or producing obstructions throughout the installation of casing. Competent units include sound igneous and metamorphic rock, sound carbonates and well-cemented sandstones. ()

18. **Conductor Pipe**. A permanent, relatively short string of large-diameter casing which is set to keep the top of the borehole open and provide a means of returning the ~~up flowing~~ drilling fluid from the well bore to the surface until the first casing string is set in the well. ()

19. **Confining Layer**. A subsurface interval of low-permeability earth material that lies above and/or below one or more water-bearing zones. Confining layers isolate water-bearing zones, and provide natural protection against waste and contamination of the ground water resources. ()

20. **Contaminant**. Any chemical compound, biological agent, or physical property not occurring naturally in ground water or that occurs naturally at lower concentrations or to lesser degrees. Contaminant also includes thermal or aesthetic properties that result in ground water becoming less suitable for a beneficial use as determined by the Director. ()

21. **Contamination**. The direct or indirect introduction into ground water of any contaminant caused in whole or in part by human activities. The term includes the introduction of any contaminant from one geologic

interval to another, and the introduction of any contaminant that may cause a violation of the Ground Water Quality Rule, IDAPA 58.01.11. ()

22. Decommissioned Well. See Abandoned Well. ()

23. Department. The Idaho Department of Water Resources. ()

24. Director. The Director of the Idaho Department of Water Resources or his duly authorized representatives. ()

25. Disinfection. The introduction of chlorine or other agent or process approved by the Director in sufficient concentration and for the time required to inactivate or kill fecal and coliform bacteria, indicator organisms, and other potentially harmful pathogens. ()

26. Decontamination of Equipment. The process of cleaning equipment in order to prevent the introduction of contaminants into an existing well. ()

27. Drive Point (also Sand Point). A hole through which ground water of any temperature is sought or encountered created by joining a "drive point" to a length of pipe and driving or drilling the assembly into the ground. Drive point holes are not allowed to exceed 18-feet in depth. The depth of the hole is determined by measuring the maximum vertical distance between the natural land surface and the deepest portion of the hole. ()

28. Grout. A mixture of cement and potable water (as in neat cement) or bentonite and potable water of a consistency appropriate to be pumped through a pipe and emplaced as seal material. Additives, if approved, may be added to achieve desired properties. ()

29. Hydro-Fracturing. A process whereby potable water or other Department-approved fluid is pumped under high pressure into a well to fracture the reservoir rock surrounding the well bore in order to increase flow into the well. ()

30. Incompetent Unit. Subsurface earth materials that are not sufficiently hard or durable to sustain an open borehole without caving or producing obstructions throughout the installation of casing. Incompetent units include all earth materials that are not bedrock (such as soil, sand, gravel, clay, overburden), decomposed, easily fractured or friable bedrock, weakly cemented conglomerates and sandstones, and shale. ()

31. Injection Well. Any excavation or artificial opening into the ground that meets the following three (3) criteria: ()

a. It is a bored, drilled or dug hole, or is a driven mine shaft or driven well point; and ()

b. It is deeper than its largest straight-line surface dimension; and ()

c. It is used for or intended to be used for subsurface placement of fluids. ()

32. Intermediate Casing String. The casing installed below the surface casing within any well to seal out specific zones. Such strings may be overlapped, or telescoped, and sealed into the surface casing, or extend continuously to land surface. ()

33. Liner. The inner piping or conduit, often of thermoplastic material, placed inside of casing. Liner extending beyond a casing shall be considered casing and must meet all casing requirements. ()

34. Mineralized Water. Any ground water having a TDS (total dissolved solids) concentration greater than 5000 ppm. ()

35. Modify. To deepen a well, increase or decrease the diameter of the casing or the well bore, install a liner, place a screen, perforate existing casing or liners, alter the seal between the casing and the well bore, or any other activity that could ~~will~~ cause a violation of these rules. ()

36. Monitoring Well. Any well more than eighteen (18) feet in vertical depth constructed to evaluate, observe or determine the quality, quantity, temperature, pressure or other characteristics of the ground water or aquifer. ()

37. Natural Filter Pack (also Natural Pack). Graded sand and gravel between the borehole and the perforated casing or well screen produced from the native aquifer material matrix during well development. A filter pack is used to prevent the movement of sand and sediment into the well, and to enhance the ability of the well to yield water. ()

38. Neat Cement. A mixture of Portland cement Types I, II, or III~~, or high alumina cement~~ with not more than six (6) gallons of potable water per 94 pound sack of cement. ()

39. Neat Cement Grout. A mixture of neat cement and up to 5% pre-hydrated bentonite. The total amount of water used, including that used to pre-hydrate bentonite, shall not exceed 6.5 gallons per 94-pound sack of cement. ()

40. Pitless Adaptor (also Pitless Unit). An assembly of parts attached to a well casing to allow for subsurface pump discharge and access to the interior of the well casing for installation or removal of pump appurtenances while preventing contaminants from entering the well. ()

41. Potable Water. Water suitable for human consumption. ()

42. Production String. The casing through which ground water resources of any temperature are produced. The production string shall extend from the producing zone to land surface. ()

43. Remediation Well. A well used to inject or withdraw fluids, vapor, or other solutions approved by the Department for the purposes of remediating, or controlling potential or known contamination. Remediation wells include those used for air sparging, vapor extraction, or injection of chemicals for remediation or in-situ treatment of contaminated sites. ()

44. Seal Material (also Seal or Sealant). The low permeability material, such as bentonite, grout, or neat cement placed into an annular space ~~between the borehole wall and the casing~~ that prevents the horizontal and vertical movement of water, or the mixing (commingling) of waters from discrete aquifers. ()

45. Surface Casing. The outermost, shallowest permanent casing string used ~~required~~ to ~~protect fresh water zones~~ isolate saturated surface , to provide sufficient pressure control during drilling operations, and to support the wellhead.~~:~~ *(see #41)* ()

46. Surface Seal. An annular seal installed between the borehole wall and the outside perimeter of the surface casing that prevents the horizontal and vertical movement of water. Surface seals create a~~n~~ low-permeability ~~impermeable~~ barrier between the land surface and subsurface intervals. ()

47. Temporary Casing. Steel pipe used to retain the sides of the borehole within incompetent units and to prevent the ingress of water into the borehole during drilling and well construction. Temporary casing is removed following the installation of the permanent well casing and prior to well completion. ()

48. Thermoplastic Pipe. Plastic piping material meeting the requirements of ASTM F 480 and designed for use as well casing and/or liner. ()

49. Unusable Water Well. A borehole or constructed well intended and permitted for ground water production that, for any reason, fails to produce water of adequate quantity or desirable quality for its intended and authorized use. ()

50. Waste. Any unreasonable physical misuse or squandering of the ground water resource including, but not limited to:
a) the flow of water from an aquifer into an unsaturated subsurface interval, b) the transfer and/or mixing of waters from one aquifer to another (aquifer commingling), c) the release of ground water to the land surface, by natural artesian flow or by pumping, whenever such release does not comply with an approved and permitted beneficial use, and d) the release of ground water to the land surface, by natural artesian flow or by pumping, during times inconsistent with an approved and permitted beneficial use (for example, prior to or after irrigation season). ()

51. Well. An artificial excavation or opening in the ground more than eighteen (18) feet in vertical depth below the natural land surface by which ground water of any temperature is sought or obtained. The depth of a well is determined by measuring the maximum vertical distance between the land surface and the deepest portion of the well. Well also means any waste disposal and injection well as defined by Section 42-3902, Idaho Code. Well also means any test well, monitoring well, cathodic protection well, observation well, recycling well, ground source heat exchange well, or exploratory well more than eighteen (18) feet in vertical depth below the natural land surface that is constructed to evaluate the ground water resource or to evaluate contamination of the resource. Well does not mean a hole drilled for mineral exploration, oil and gas exploration (for which a permit has been issued pursuant to Section 47-320, Idaho Code), for mine shafts or adits, for temporary construction dewatering, for foundation geotechnical evaluations, or for elevator shaft installation. ()

52. Well Development. The act of bailing, jetting, pumping, or surging water in a well to remove drilling fluids, fines, and suspended materials from within the borehole, screen, filter pack, and aquifer to establish the optimal hydraulic connection between the well and the aquifer. ()

53. Well Driller. Any driller or operator authorized under I.C. §42-238. ()

54. Well Drilling. The act of constructing, modifying, or abandoning a well. ()

55. Well Owner. The owner of the land on which the well is located unless a deed, covenant, contract, easement, or other documentation acceptable to the Director demonstrates that the well is the responsibility of another party. ()

56. Well Rig. Any power driven percussion, rotary, boring, digging, jetting, or auguring machine used in the construction or modification of a well. ()

011. ABBREVIATIONS (RULE 11).

012. -- 024. (RESERVED).

025. GENERAL STANDARDS FOR CONSTRUCTION OF COLD WATER WELLS (RULE 25).

01. Standards for Every Well. The Well Driller shall construct each well: ()

a. In accordance with these rules and with the conditions of approval of any drilling permit approved pursuant Section 42-235, Idaho Code, and in a manner that will guard against waste and contamination of the ground water resources. The adopted rules are minimum standards that must be adhered to in the construction of all wells, and in the modification or abandonment of existing wells. The Director shall require measures beyond the minimum standards when determined necessary to protect ground water resources. If the well driller determines, during construction, modification, or abandonment of any well, that the minimum standards are not sufficient to protect the ground water resources, the well driller will take measures over and above these minimum standards as necessary to achieve this goal. The well driller and well owner are charged with the responsibility of taking appropriate steps to guard against waste and contamination of the ground water resources; ()

b. Based on the geologic and ground water conditions known to exist or anticipated at the well site; ()

c. Such that it is capable of producing, where obtainable, the quantity of water to support the approved beneficial uses by the well owner, subject to law; ()

d. Such that it complies with these standards and the following siting and distance requirements:

Separation of Well from:	Minimum Separation Distance (feet)
Potentially hazardous underground tanks	50
Existing Public Water Supply well	50
Other existing well	25
Septic drain field	100
Septic tank	50
Septic tank, drainfield or outflow pipe of system with more than 2,500 GPD of sewage inflow	300
Sewer line (gravity)	50
Sewer line (pressure)	100
Property line	10
Permanent buildings or structures	10
Streams, canals, irrigation ditches or laterals, and other permanent, temporary, or intermittent bodies of water	50

Compliance with the above siting and separation distances does not exempt the driller from complying with other requirements established by other authorized bodies (e.g. District Health Departments, Idaho Department of Environmental Quality, etc.); ()

e. Such that, if used for injection, it complies with these standards and IDAPA 37.03.03, "Rules for the Construction and Use of Injection Wells"; and ()

f. Such that, if used for a Public Water Supply, it complies with these standards and with IDAPA 58.01.08, "Idaho Rules for Public Drinking Water Systems." ()

02. Waivers. The Well Driller may submit a detailed plan and written request to the Director for a waiver of these minimum standards. The waiver may be granted if the Director determines that the ground water resources and public health will be protected according to the plan, and the waiver will not conflict with other requirements established by authorized bodies (e.g. District Health Departments, Idaho Department of Environmental Quality, etc.). Well drilling shall not commence until the Director has approved the plan and granted the waiver in writing. If a waiver is granted, all well drilling activities shall adhere to the plan as approved. ()

03. Requirements for Licensure. No person except those ~~Well Drillers~~ licensed as Well Drillers under the authority of I.C. §42-238 shall construct, modify or abandon a well. ()

04. Documents to be Provided to Well Owner. The Well Driller shall provide the well owner with a copy of the approved well drilling permit, and a copy of the well driller's report upon completion of the well. ()

026. -- 029. (RESERVED).

030. STANDARDS FOR ALL ~~STEEL~~ CASING AND LINERS (RULE 30).

01. Requirements for Casing. The Well Driller shall install steel, or steel and thermoplastic casing in every ~~water well and injection~~ well. All casing and liner to be installed must be in new condition, free of all defects, and clearly marked by the manufacturer with all specifications required by these rules. ()

02. Requirements for Casing and Liner Installation. The Well Driller shall:

a. Install a minimum of 20 feet of steel surface casing meeting specifications of Rule 31.01; ()

b. Ensure that the steel surface casing extends not less than eighteen (18) inches above the land surface and finished grade, and not less than eighteen (18) feet below land surface; ()

c. Ensure that all casing extends and is properly sealed to the depth required by these Rules; ()

d. Prior to the completion of a well per Rule 84, install onto the steel surface casing a) a one-fourth inch (1/4") thick, solid, new or like-new steel plate welded to and completely covering the casing, or b) a commercially manufactured sanitary well cap, or c) a commercially manufactured, water-tight, snorkel-vented or non-vented well cap on any well susceptible to submergence, and d) a Department approved control device per Rule 74 on any well that flows at land surface. Cast aluminum well caps are prohibited; ()

e. Join all casing and liner lengths in accordance with current industry standards and practices, and/or manufacturer's specifications and recommendations; ()

f. Ensure all joints are straight and watertight; and ()

g. Not allow perforated casing to extend into or through any confining layer below the water table. ()

03. Requirement for Integrity of Casing And Liners. The Well Driller shall install casing and liners of sufficient integrity and strength to withstand the normal subsurface forces and corrosive effects for the life of the well.

031. STANDARDS FOR STEEL CASING AND LINERS (RULE 31).

021. Minimum Steel Casing Specifications. The Well Driller shall install steel casing that meets or exceeds the American Society of Testing and Materials (ASTM) standard A53, Grade B or American Petroleum Institute (API) 5L Grade B, and that meets the following specifications: ()

Nominal Size: (in.)	Outside Diameter (in.)	Depth Below Surface (ft.)	Nominal Wall Thickness (in.)
4	4.5	Any	0.237
5	5.563	Any	0.250
6	6.625	Any	0.250
8	8.625	Any	0.250
10	10.75	< 1000	0.250
10	10.75	1000 +	0.375
12	12.75	< 1000	0.250
12	12.75	1000 +	0.375
14	14	< 800	0.250
14	14	800 +	0.375
16	16	< 400	0.250
16	16	400 +	0.375
18	18	< 300	0.250
18	18	300 +	0.375
20	20	< 300	0.250
20	20	300 +	0.375
22	22	< 300	0.250
22	22	300 +	0.375
24	24	< 1000	0.375
24	24	1000 +	**
26	26	< 1000	0.375
26	26	1000 +	**

28	28	< 1000	0.375
28	28	1000 +	**
30	30	Any	**
30	>30	Any	**

** Design by Professional Engineer Required ()

032. ~~Standards~~ Additional Requirements for Steel Casing and Liner ~~Installation~~. The Well Driller shall: ()

~~f~~a. ~~j~~Join casing and liner lengths by welded ~~joints~~ or threaded ~~screw couple~~ joints; and ()

~~g~~b. ~~e~~Ensure that welded joints ~~shall be~~ are made using welding rods of at least equal quality to the casing metal, ~~shall be~~ are at least as thick as the wall thickness of the well casing, and ~~shall be~~ are fully penetrating. Casing ends to be joined by welding shall be properly prepared, beveled and gapped to allow full penetration of the weld. Welded joints shall have a minimum of two (2) passes including a "root" pass and have minimal undercut when complete. ()

0321. -- 0394. (RESERVED).

040. STANDARDS FOR THERMOPLASTIC PIPE CASING AND LINERS (Rule 40).
Thermoplastic pipe used as casing or liner shall conform to ASTM F 480 and NSF-WC. ()

01. Conditions for the Use of Thermoplastic Pipe Casing and Liners. ()

a. Thermoplastic pipe may be used as liner when completely enclosed inside of permanent steel casing in all wells. Thermoplastic pipe used as liner shall have a minimum rating of SDR 26. ()

b. Thermoplastic pipe may be used as casing in all monitoring wells. Thermoplastic pipe used as casing in monitoring wells shall have a minimum rating of schedule 40. ()

c. Thermoplastic pipe may be used as casing in other wells only when drilling of the borehole confirms its suitability for use. The conditions for use of thermoplastic pipe as casing in other wells shall conform to the following: ()

i. Competent Units: Thermoplastic pipe having a minimum rating of SDR 21 may be used as casing only within uninterrupted competent units. ()

ii. Incompetent Units, or alternating (competent/incompetent unit) subsurface intervals: Thermoplastic pipe having a minimum rating of SDR 17 may be used as casing throughout all incompetent unit intervals, or wherever the subsurface geology alternates between competent and incompetent units. ()

d. All thermoplastic pipe used as casing shall be installed with centralizers placed not more than 40 feet apart, shall be fully supported by artificial filter pack in the screened interval, and sealed by positive displacement from the top of the filter pack (a) to land surface, or (b) into the permanent steel casing. Artificial filter pack or reserve filter pack (the additional amount of filter pack material emplaced above a well screen to allow for settling) shall not extend past any confining layer above the screened interval. ()

e. In addition to the above and for each casing or liner application, the well driller shall ensure the selection and use of the appropriate, minimum-rated thermoplastic pipe with respect to differential hydraulic pressures in accordance with the manufacturer's Resistance to Hydraulic Collapse Pressure (RHCP) specifications. ()

02. Additional Requirements for Thermoplastic Pipe Casing and Liner. All thermoplastic pipe casing and liner shall be installed in accordance with the manufacturer's recommendations and specifications, and as required by these rules. The Well Driller shall: ()

a. Not use thermoplastic pipe as casing or liner in any Low Temperature Geothermal Resource well or Geothermal Resource well.

b. Not use thermoplastic pipe as working casing while drilling the borehole; ()

c. Not drive, force, jack, or push thermoplastic pipe into place. Thermoplastic pipe shall be lowered or floated into an obstruction-free borehole; and ()

d. Not use cement-based sealants in direct contact with thermoplastic pipe. ()

041. STANDARDS FOR MINIMUM WELL CASING OR LINER SIZE (RULE 41).
Based on the yield the well owner requires and upon subsurface conditions, the Well Driller shall install casing and/or liner of sufficient size to produce the desired yield without harm to the aquifer. Minimum size casing shall be defined according to the table below: ()

Pumping Rate Design (gpm)	Nominal Size of Pump Bowls (inches)	Minimum Size of Well Casing/Liner (inches)
Less than 100	4	5 ID
100 to 200	4	6 ID
75 to 175	5	6 ID
75 to 350	6	8 ID
100to 700	8	10 ID
200 to 700	10	12 ID
800 to 1800	12	14 OD
600 to 1300	14	16 OD
1200 to 1800	16	20 OD
1800 to 3000	20	24 OD
3000 to 4500	22	28 OD
4500 +	22	30 OD

()

042. STANDARDS FOR PLUMBNESS AND ALIGNMENT OF CASING AND LINER (RULE 42).
The Well Driller shall install casings and liners sufficiently plumb and straight to allow the installation or removal of screens, liners, pumps and pump columns without binding or having adverse effects on the operation of the installed pumping equipment. If it is determined that the borehole, casings, and/or liners are not sufficiently plumb and straight to allow the above tasks as described, the well driller shall repair or abandon the well in accordance with these rules. ()

~~**01.The Well Driller shall demonstrate plumbness and alignment by one of the following methods:**~~

~~**a.** By performing a cylindrical plummet test, or~~

~~**b.** By using a photographic, mechanical, or pendulum drift indicator, or~~

~~**c.** By successfully passing a forty-foot test section of pipe not less than 0.5 inch smaller than casing I.D. freely from the bottom of the well.~~

043~~1~~. -- 049. (RESERVED).

050. GENERAL STANDARDS FOR SEAL MATERIAL (RULE 50).
The Well Driller may use bentonite or cement sealants to seal wells. All bentonite or cement grouts shall be pumped into place from the bottom upward via tremmie pipe or other method of positive displacement approved by the Director. ()

01. Standards for Bentonite Sealants.

a. The Well Driller may install bentonite pelletsized, granulesated, chips, or powder~~, or chip bentonite~~ in the construction of seals or in the abandonment~~decommissioning~~ of wells. ()

b. The Well Driller shall install only bentonite specifically designed for sealing or decommissioning and within the industry tolerances for dry western sodium bentonite. ()

c. All unhydrated bentonite used for sealing or decommissioning must be free of organic polymers. ()

d. Polymer additives must be designed and manufactured to meet industry standards to be non-degrading and must not act as a medium which will promote growth of micro-organisms. ()

e. The Well Driller shall install and place bentonite in accordance with the manufacturer's specifications. ()

f. The Well Driller shall install dry granular bentonite or bentonite chips in an annular space with a minimum diameter of four (4) inches larger than the nominal size of the largest-diameter casing. ()

02. Standards for Cement Sealants.

a. Neat cement consists of either portland cement types II, III, or high-alumina cement mixed with not more than six (6) gallons of potable water per sack of cement (ninety-four (94) pounds per sack). ()

b. Neat cement grout consists of neat cement with up to five (5%) percent bentonite clay added, by dry weight of the bentonite. Bentonite is added to improve flow qualities and compensate for shrinkage. ()

c. Concrete sealants consist of clean, hard and durable aggregate with not less than five (5) sacks (ninety-four (94) pounds per sack) of portland cement per cubic yard of concrete sealant. ()

i. The maximum diameter of aggregate particles may not exceed one and one-half (1 1/2) inches, but in any case may not exceed one fifth (1/5) the minimum width of the casing thickness. ()

ii. The ratio of coarse aggregate to fine aggregate (passing No. 4 U.S. Standard Sieve) must be approximately one and one-half to one (1 ½ to 1) by volume, but in any case, may not exceed two to one (2 to 1) nor be less than one to two (1 to 2). ()

iii. Expanding agents, such as aluminum powder, may be used at a rate not exceeding seventy-five thousands (0.075) ounce (one (1) level teaspoon) per sack (ninety-four (94) pounds per sack) of dry cement. The powder may not contain polishing agents. High-alumina cement and portland cement of any type must not be mixed together. ()

d. All grout shall be mixed and installed in accordance with the American Petroleum Institute Standards - API Class A through H, as found in API RP10B "Recommended Practice for Testing Oil Well Cements and Cement Additives," or other Department approved standard. ()

e. Cement sealants shall not be placed in direct contact with any thermoplastic pipe used as casing or liner. ()

03. Prohibited Seal Materials. The Well Driller shall never use drill cuttings, native dirt, soil, sand or gravel, or puddling clay to seal a well. ()

04. Seal Placement. Approved seal material shall be installed by one (1) or more of the following methods:

a. Seal material placed below the water table by pressure piping directly to the point of application or by placing by using a dump bailer or tremie tube. When used to place seal material, the discharge end of the tremie pipe shall be submerged in the grout to avoid breaking the seal while filling the annular space. ()

b. Cement, cement grout, or neat cement shall be installed below the water table by methods that avoid segregation or dilution of the material. ()

c. Only dry bentonite granules manufactured or treated for installation below the water level may be poured into the well. ()

d. Above the water table, dry bentonite granules may be poured into the borehole or well casing. ()

051. GENERAL METHODS FOR INSTALLATION (RULE 51).
The Well Driller shall: ()

01. Neat Cement or Neat Cement Grout. Place neat cement or neat cement grout at least seventy-two (72) hours before additional drilling takes place, unless special additives are mixed with the neat cement or neat cement grout that cause it to set in a shorter period of time. All grout shall be mixed and installed in accordance with the American Petroleum Institute Standards - API Class A through H, as found in API RP10B "Recommended Practice for Testing Oil Well Cements and Cement Additives," or other Department approved standard. ()

02. Hydrated Seal Material. Install all hydrated seal material using a tremie pipe or by pressure pumping the mixture from the bottom of the annular space to the surface in one continuous operation. ()

03. Fills the Annular Space. Ensure that pelletized, granulated, powdered, or chipped unhydrated bentonite completely fills the annular space and the seal is free of voids or bridges. ()

04. Calculate the Volume of Unhydrated Bentonite. Shall calculate the volume of unhydrated bentonite that would fill the annular space between the casing and the borehole and shall store at least 125% of the calculated unhydrated bentonite at the drill site. ()

05. Pouring Unhydrated Bentonite from the Surface. If pouring unhydrated bentonite from the surface to fill the annular space between the casing and the borehole, shall pour bentonite around all sides of the casing and shall use a tag line to measure the depth to the top of the bentonite. ()

06. Installing Unhydrated Bentonite Below the Water Table. If installing unhydrated bentonite below the water table, shall install only unhydrated bentonite specifically manufactured for installation below the water level. ()

07. Installing Seal Material by Pressure Pumping. If installing seal material by pressure pumping though a tremie pipe or float shoe, the Well Driller may reduce the annular space between the casing and the borehole from a minimum of four (4) inches to a minimum diameter of two (2) inches. ()

052. REQUIREMENTS FOR SURFACE SEALING (RULE 52).
The Well Driller shall seal in the annular space between the borehole and the permanent surface casing seal in all water wells to prevent surface water from flowing down the outside of the casing. ()

01. Standards for Surface Sealants. The Well Driller shall: ()

a. Install the surface seal with a minimum diameter of four inches larger than the nominal size of the surface casing, to include the outside diameter of the bell, the bell and hub couplings, and the drive shoe. ()

b. Install a surface seal from land surface to a minimum depth of ten feet below the lowest elevation of the water table. ()

c. If the lowest elevation of the water table is less than eight (8) ft. below land surface, install a surface seal from land surface to a minimum depth of eighteen (18) ft. feet below the land surface. ()

d. Ensure that the seal fully surrounds the permanent casing, is evenly distributed, is free of voids, and extends to undisturbed or recompacted soil. ()

02. Methods to Install Surface Sealants. The Well Driller may: ()

a. Install the surface seal by pressure grouting from the bottom of the annular space until the seal material flows at the surface. ()

b. Install the surface seal through a tremie pipe. ()

c. Install the surface seal by pouring granular bentonite from the surface of the ground. When using this method, the Well Driller will tag the top of the bentonite as it is poured from the surface. ()

03. Use of Temporary Casing. The Well Driller may install temporary casing in all unconsolidated formations such as in gravels, sands, or other unstable conditions where the Well Driller does not use drilling fluids or other means to keep the borehole open. When the Well Driller removes the temporary surface casing, the Well Driller shall place the seal material in the annulus in accordance with the procedures above. ()

053. REQUIREMENT TO REPAIR OR REPLACE SURFACE SEALS (RULE 53).
Whenever a Well Driller moves the permanent surface casing or damages the existing surface seal, or whenever a Well Driller discovers that a surface seal was never installed on the well or has been damaged, the Well Driller shall repair, replace, or install a minimum of eighteen feet of surface seal around the permanent casing. ()

054. REQUIREMENTS FOR ~~FORMATION~~ ANNULAR SEALING (RULE 54).
If the well obtains artesian water, the Well Driller shall seal the annular space between the borehole and the permanent casing to prevent movement of artesian water flowing up or down the outside of the casing. ()

01. Sealing in Incompetent Units ~~of Unconsolidated Formations~~ without Significant Clay Beds. If a Well Driller installs a well into an aquifer overlain by Incompetent Units ~~unconsolidated formations (such as sand and gravel)~~ without significant clay beds, the Well Driller will seal the annular space between the borehole and the permanent surface to a minimum depth of ten (10) feet below the lowest elevation of the water table. ()

02. Sealing in Incompetent Units ~~of Unconsolidated Formations~~ with Significant Clay Beds. If a Well Driller installs a well into an aquifer overlain by clay or other confining formations that are at least six (6) feet thick, the Well Driller shall seal the annular space between the borehole and the permanent surface casing. The Well Driller shall: ()

a. Install a borehole at least four inches greater in diameter than the nominal size of the permanent well casing from the land surface into the clay bed or other confining formation located directly above the aquifer from which the well will obtain water. ()

b. Fill the annular space with bentonite (slurry or unhydrated), cement grout, or neat cement to form a watertight seal between the casing and all confining formations encountered during drilling. ()

c. Install all bentonite slurries, cement grout, or neat cement in the annular space by either pumping or tremming the seal material from the lowest clay bed or other confining formation of significance encountered, to land surface. ()

d. Keep the drill hole open through the use of a temporary casing or any other drilling method that stabilizes the borehole wall. ()

03. Sealing in Competent Units~~of Consolidated Formations~~. If a Well Driller installs a well that penetrates an aquifer, either within or overlain by a Competent Unit~~consolidated formation~~, the Well Driller shall seal the annular space between the borehole and the permanent casing using one (1) of the following procedures: ()

a. Procedure One. The Well Driller shall: ()

i. Extend the upper drill hole at least four inches greater in diameter than the nominal size of the permanent well casing from land surface into a Competent Unit~~sound, unfractured, consolidated formation~~. ()

ii. Install an unperforated permanent casing to extend to this same depth and drive the lower part of the casing into the Competent Unit ~~consolidated formation~~ to establish a watertight seal between the formation and the casing. ()

iii. Place seal the annular space on the outside of the casing to land surface with cement grout, neat cement, or bentonite. ()

b. Procedure Two. The Well Driller shall: ()

i. Install an upper drill hole at least four inches greater in diameter than the nominal size of the permanent casing from land surface to a depth of at least eighteen feet.

ii. Drive an unperforated permanent casing into the Competent Unit~~consolidated formation~~ to establish a watertight seal between the formation and the casing. ()

iii. Keep the annular space between the upper drill hole and the permanent casing at least one-half (1/2) full with unhydrated bentonite or bentonite slurry during driving of the casing into the Competent Unit~~consolidated formation~~. ()

iv. Fill the remainder of the annular space to land surface with cement grout, neat cement, or bentonite. ()

055. -- 059. (RESERVED).

060. REQUIREMENTS FOR SEALING OF ARTESIAN WELLS (RULE 60).
If the Well Driller installs a well that produces or obtains artesian water, the Well Driller shall: ()

01. Install Unperforated Well Casing into the confining stratum overlying the artesian zone and emplace seal material on the outside of the casing, as described above; ()

a. If the well flows at the surface, install a control valve at the surface to ensure that the flow can be completely stopped; and ()

b. If leaks occur around the well casing or adjacent to the well, the Well Driller shall install seals, packers, casing or grout that will eliminate the leakage. The Well Driller shall not move his well drilling rig from the site until leakage has been eliminated. ()

02. Precautions to Case and Seal Out Aquifers. Take all precautions to case and seal out aquifers which may lead to waste or contamination. ()

061. REQUIREMENTS FOR SEALING OF ARTIFICIAL FILTER PACK WELLS (RULE 61).
The Well Driller shall seal every artificial filter pack well using one (1) of the following methods:

01. Sealing of Filter Pack With Access Pipes. If the Well Driller injects filter material through access pipes or tubes, the Well Driller may inject sealing materials through the access tubes. The Well Driller shall:()

a. shall ensure that the seal is watertight around the injection pipe and that the pipe is equipped with a watertight cap or plug. ()

b. shall ensure that the seal extends to a minimum of ten (10) feet below the lowest elevation of the water table. If the lowest elevation of the water table is less than eight (8) ft. below land surface, the Well Driller shall install a surface seal from land surface to a minimum depth of eighteen (18) ft. feet below the land surface. ()

c. shall install a watertight cap or plug on the access pipe or pipes, if the pipes are used for injecting sand into the filter pack. ()

02. Sealing of Filter Pack with Temporary Casing. If the Well Driller installs a temporary casing, the Well Driller shall. ()

a. install the temporary casing at least four inches in diameter greater than the permanent casing and will install the temporary casing to at least ten (10) ft. below the highest water table elevation. ()

b. shall fill the annular space on the outside of the permanent casing with cement grout or bentonite as the temporary casing is withdrawn. ()

062. REQUIREMENTS FOR SEALING OF DRIVEN WELLS(HOLES?) (RULE 62).
(Note to IDWR, in definition section we stated that driven wells could not exceed 18-ft) The Well Driller shall install surface and formation seals in driven wells. The Well Driller shall: ()

01. Casing. Drive each casing through an upper hole which shall be at least four (4) inches greater in diameter than the inner casing or liner; ()

02. Annular Space. Ensure that the annular space between the upper oversized drill hole and each casing is at all times at least one-half (1/2) full with bentonite or bentonite slurry at all times during driving of the pipe; ()

03. Temporary Casing. If a temporary casing or other means of maintaining an open borehole is utilized by the Well Driller, install temporary casing that has an outside diameter a minimum of four (4) inches larger than the permanent casing (for example, a ten (10) inch temporary casing for a six (6) inch permanent casing); and ()

04. Removal of the Temporary Casing. ~~Shall f~~Fill the annular space between the borehole and the permanent surface with sealant during removal of the temporary casing. ()

063. REQUIREMENTS FOR SEALING OF JETTED WELLS (RULE 63).
(Note to IDWR, in definition section we stated that jetted wells were not allowed) The Well Driller shall install the seal in jetted wells to seal the annular space between the permanent casing and undisturbed native soil. The Well Driller shall ensure that the annular space between the upper oversized drill hole and the permanent casing is at all times at least one-half (1/2) full with bentonite or bentonite slurry throughout all driving of the pipe. The remaining annular space to land surface shall be filled with cement grout, neat cement, or bentonite. ()

064. -- 069. (RESERVED).

070. INJECTION WELLS (RULE 70).
The construction and/or modification of all injection wells shall comply with IDAPA 37.03.03. Additionally, the construction, ~~and/or~~ modification, and/or abandonment of all injection wells greater than 18-feet in depth shall comply with these rules. The well driller shall obtain a copy of the injection permit issued by the Department in addition to the required drilling permit prior to commencement of construction and/or modification of any injection well greater than 18-feet in depth. ()

071. CATHODIC PROTECTION WELLS (RULE 71).

Only a Well Driller shall construct, or abandon a cathodic protection well. Cathodic protection wells shall be constructed in compliance with these rules. A detailed construction plan shall be included with the drilling permit application. ()

072. MONITORING AND REMEDIATION WELLS (RULE 72).

~~Well Designers shall submit designs and specifications for each monitoring or remediation well and every monitoring or remediation well network to the Director for approval.~~ ()

01. Site Specific Monitoring and/or Remediation Programs Authorized Under Blanket Permits. The application for a blanket permit shall include a design proposal prepared by a licensed engineer or licensed geologist pursuant to I.C. 42-235. Blanket permits for well networks may be approved for site-specific monitoring and/or remediation programs. ()

02~~1~~. **Plans and Specifications for Monitoring or Remediation Wells and Well Networks**. The designs and specification shall demonstrate that: ()

a. The ground water resources are protected against waste and contamination; ()

~~**b.** The monitoring wells and monitoring well network will obtain the information on water elevations and water quality for which the monitoring well or monitoring well network is required;~~ ()

b~~**c**~~**.** The remediation wells ~~and remediation well network~~ will inject or withdraw only fluids, gasses ~~(such as air, ground water,~~ or ~~other~~ solutions approved by the Department~~) at the appropriate location and in sufficient quantities, at sufficient concentrations, and for sufficient duration to remediate, clean up, or control potential or known ground water contamination~~; ()

c~~**d**~~**.** The remediation and monitoring wells will be constructed so as to prevent ~~the spread of contamination between~~ aquifer~~s~~ commingling; and~~;~~ ()

~~**e.** The well casing, screens, filler and seal materials are resistant to the corrosive effects of chemicals that might be expected in the ground water, and~~ ()

d~~**f**~~**.** The remediation and monitoring wells will be properly abandoned upon project completion and in accordance with these rules ~~minimum standards herein~~. ()

03~~2~~. **Use of Monitoring or Remediation Wells**. No person may divert ground water ~~for domestic, industrial, municipal, commercial, or agricultural uses~~ from a remediation or monitoring well for any purpose not authorized by~~without the prior approval of~~ the Director. ()

~~**03. Requirements for Licensure**. No person except Well Drillers licensed under the authority of Title 42, Chapter 2, Section 42-238 shall construct, install, or modify a monitor or remediation well. ()~~

073. ACCESS PORT (RULE 73).

All wells shall be equipped with an access port that will allow measurement of water level and well depth. Wells equipped with a commercially manufactured well cover cap as per RULE 30 do not require installation of an additional access port. ()

074. FLOWING ARTESIAN WELLS. (RULE 74).

All wells that flow at land surface shall be equipped with a control device as required by I.C 42-1603. All control devices shall:

~~a.~~ **a.** C~~c~~ompletely control artesian flow from the well~~;~~. and

~~b.~~ **b.** ~~a~~Allows for the installation and removal of a gauge to measure shut-in pressure.

074. -- 079. (RESERVED).

080. CONDITIONS REQUIRING THE ABANDONMENT (DECOMMISSIONING) OF A WELL (RULE 80).

The well owner shall maintain every well in a manner that will prevent waste ~~or~~ and contamination of the ground water resources.

01. The Director may require abandonment in accordance with these rules if the well: *(Note: need to establish a time-frame for abandonment)* ()

a. Does not meet or ~~C~~cannot be ~~maintained, modified, or~~ repaired to meet these standards;~~,~~ ()

b. ~~Does not produce a sufficient quantity of water for a beneficial use~~Meets the definition of Unusable Water Well *(Note: make sure this works w/ def'n and doesn't provide loophole for other wells/intentions)*~~.~~;()

c. Produces sand in excess of the limits identified in Rule~~ULE~~ 9~~5~~6;~~.~~ ()

d. Poses a threat to human health and safety;~~.~~ and/or ()

e. ~~If t~~There is no valid water right or other ~~required~~ specific authorization for the use of the well. ()

02. All monitoring and remediation wells, and piezometers must be abandoned in accordance with these rules upon project completion. ()

081. PERSONS AUTHORIZED TO ABANDON (DECOMMISSION) WELLS (RULE 81).

No person shall abandon a well in Idaho without first obtaining a driller's license or receiving a waiver of the license requirement from the Director of the Department of Water Resources. Authorization is required from the Director prior to the abandonment. Upon completion of abandonment, the person who conducted the abandonment shall submit to the Department a report describing the abandonment. ()

082. PROCEDURES TO ABANDON (DECOMMISSION) WELLS (RULE 82).

The Director may require well abandonment in accordance with the following: ()

01. Cased Wells Without a Continuous Seal From Top of Intakes or Screen to the Surface. Use one (1) of the following methods: ()

a. The well casing shall be perforated every five (5) feet from the bottom of the casing to within five (5) feet of the surface. Perforations made shall be adequate to allow the free flow of seal material into any voids outside the well casing. There shall be at least four equally spaced perforations per section circumference. Approved grout shall be injected with sufficient pressure to fill any voids outside of the casing. A sufficient volume shall be used to completely fill the well. ()

b. Fill the borehole with approved seal material as the casing is being removed. ()

02. Cased Wells with Full-Depth Seals. If the well is cased and sealed from the top of the screen or production zone to the land surface, the well shall be completely filled with approved seal material. ()

03. Uncased Wells. Uncased wells shall be completely filled with approved seal material. ()

04. Placement of Seal Material. Approved seal material shall be placed in accordance of the requirements of RULE 50. ()

083. COMPLETION OF A WELL (RULE 83).

~~The~~ Every well ~~is~~ shall be considered complete upon removal of the drill rig from the well~~. site~~ The drill rig shall not be removed from a well until it is complete and meets all requirements of these rules, unless the well driller has provided written notice to the Director~~epartment~~ that the well will be properly completed or abandoned within a specified period of time. ()

084. PITLESS ADAPTERS. (RULE 84)

No person shall install a pitless adaptor in a manner that allows the entrance of fluids or other substances around the pitless assembly and into the well. The Department shall enforce instances of improper installation that cause a violation of these rules. ~~Only Well Drillers or by persons supervised by a Well Drillers shall~~

~~a. Install, repair, or replace pitless adapters in a well. ()~~

~~b. Install only pitless adapters that are approved by Pitless Adapter Division of the Water Systems Council. ()~~

~~c. Cut a hole with an opening large enough to allow seating of gaskets in the casing with a saw or cut a hole in the casing with a torch and using a cutting guide and weld the pitless adapter into place. ()~~

~~d. Ensure that the pitless adapter does not allow water to descend down the inside of the well casing. ()~~

~~e. Provide a contamination-proof entrance connection for electrical cable. ()~~

~~Alternative Rule 84~~

~~The installation of pitless adaptors will only be regulated by the Department if it is determined that the unit has been improperly installed or poses a threat to the resource.~~

085. UNPRODUCTIVE (DRY HOLE) WELL. (RULE 85)

If after drilling the quantity of water to meet a beneficial use cannot be obtained, the Well Driller shall abandon the well in accordance with these rules. ()

086. -- 090. (RESERVED).

091. EXPLOSIVES. (RULE 91)

The use of explosives inside the well casing is prohibited unless specifically authorized by the Director. ()

092. HYDRAULIC FRACTURING. (RULE 92)

Hydraulic fracturing shall be performed only by well drillers licensed in Idaho. The pressure shall be transmitted through a drill string and shall not be transmitted to the well casing. The driller shall provide a report to the Director of the fracturing work which shall include well location, fracturing depth, fracturing pressures and other data as requested by the Department. ()

093. DRILLING FLUIDS AND DRILLING ADDITIVES (RULE 93).

The Well Driller must use only potable water and shall use only drilling fluids or drilling additives that are manufactured for use in water wells, are National Sanitary Foundation (NSF), American Petroleum Institute (API), or ASTM/ANSI approved; and do not contain a concentration of any substance in excess of Primary Drinking Water Standards, as set forth in the current IDAPA 58.01.08, "Rules for Public Drinking Water Systems" in accordance with the manufacturer's specifications. The Well Driller may seek approval from the Director to use specific products on a case-by-case basis. ()

094. DISINFECTION AND DECONTAMINATION (RULE 94).

Every person shall clean and disinfect casing, tools, drilling equipment and materials, the pump, electrical wiring and controls, drop pipe, and all other equipment each and every time immediately prior to said equipment being inserted into the well. ()

01. Duties of Well Drillers. Well Drillers shall

a. Clean and disinfect all casing, tools, drilling equipment, and materials prior to beginning the drilling and construction of every well. ()

b. Disinfect all pumping equipment and sand or gravel used in an artificial filter-packed well and used to develop and pump test the well. ()

c. Use only potable water for drilling and for mixing of sealing material and shall ensure that the water has a chlorine residual of not more than one (1) part per million of free chlorine. ()

02. Disinfection Procedures. Every person shall clean and disinfect all equipment each and every time and immediately prior to the equipment being placed into the well. ()

a. Each person shall disinfect every well, the pump, electrical wiring and controls, drop pipe, and all other equipment using a fifty (50) mg/L chlorine solution. ()

b. Every person shall use all disinfectants in accordance with manufacturer's instructions. ()

c. No person shall pour, dispose, dump, discharge, or inject any fluid, liquid, or chemical into a well that would exceed the Primary Drinking Water Standards, as set forth in the current IDAPA 58.01.08, "Rules for Public Drinking Water Systems." ()

d. Every person shall maintain at all times on every well site adequate chlorine compounds, tools, and equipment to disinfect the well, the pump, electrical wiring and controls, drop pipe, and all other equipment in accordance with the following table. ()

Chlorine compound required to dose 100-ft. of water-filled well at 50 mg/L				
Casing Diameter in	**Volume of water in casing per 100 ft. of water depth gallons**	**Amount of Chemical Compound needed for each 100 ft. of water**		
		Calcium Hypochlorite1 (65% available Cl_2)	**Sodium Hypochlorite2 (12 trade percent)**	**Liquid Chlorine3 (100 percent available Cl_2) pounds**
4	65.28	0.7 oz	3.5 oz	0.03
6	146.2	1.5 oz	7.8 oz	0.06
8	261.1	2.7 oz	13.9 oz	0.11
10	408.0	4.2 oz	1.4 pt	0.17
12	587.5	6.0 oz	2.0 pt	0.25
16	1044.0	10.7 oz	3.5 pt	0.44
20	1632.0	1 lb 1oz	0.7 gal	0.68
24	2350.0	1 lb 8 oz	1.0 gal	0.98
30	3672.0	2 lbs 6 oz	1.5 gal	1.53
36	5287.0	3 lbs 6 oz	2.2 gal	2.21
48	9400.0	6 lbs 1 oz	3.9 gal	3.92
60	14690.0	9 lbs 7 oz	6.1 gal	6.13

Footnotes:
[1]The quantity of Calcium Hypochlorite is based on 65 percent available chlorine by dry weight.
[2]The quantity of Sodium Hypochlorite is based on 12-trade-percent available chlorine by US liquid measure. (Trade percent is a term used by chlorine manufacturers. Trade percent x 10 = grams of available chlorine in 1 L of solution.)
[3]Quantity of liquid chlorine is based on 100 percent available chlorine by weight.

()

095. WELL SCREENS AND INTAKES (RULE 95).

The Well Driller shall construct every well to prevent the continued production of sand ~~or~~ and ~~other~~ fine sediments. The maximum sand content produced shall not exceed 15ppm. ~~It may be~~ If necessary to meet this requirement, the well driller shall install well screens, perforated intakes, and/or filter pack(s) ~~to meet this requirement~~. Wells used in connection with a public water system ~~may~~ have more stringent requirements. ()

096. WELL DEVELOPMENT AND TESTING (RULE 96).

The Well Driller shall develop every new well to maximize the yield. The Well Driller shall determine the static water level, pumping water level, and the production rate of every well. The production rate shall be determined by a test of at least one (1) hour in duration. This information shall be documented on the Well Driller's report. ()

098. CLOSED LOOP HEAT EXCHANGE WELLS (RULE 98).

The Well Driller shall construct closed loop heat exchange wells in accordance with the intent of these rules and to prevent waste, contamination and/or aquifer commingling. The Well Driller is not required to install casing in such wells. ()

01. Installation of Closed Loop Wells. When constructing a closed loop heat exchange well, the Well Driller shall: ()

a. Construct each borehole a minimum of 4-inches larger than the combined diameter of the circulating pipes to allow the placement of approved seal material. Approved grout material shall be pumped from the bottom of the borehole to land surface;. ()

b. Install fluid-tight circulating pipe composed of polyethylene, grade p34, minimum cell classifications PE 355434C or PE 345434C conforming to ASTM Standard 3350; ()

c. Join pipe using the socket or butt heat fusion technique referenced in ASTM Standards D3261 or D2683; ()

d. Use only food grade potassium acetate or food grade propylene glycol fas circulating fluid; and

e. Pressure test the system before installation of the grout seal at no less than twice (two (2) times) 100% of the designed system operating pressure for a minimum duration of 30 minutes; and. ()

f. Replace all affected circulating pipe Iif a pressure loss is detected, the circulating pipe shall be replaced. ()

099. -- 200. (RESERVED).

201. CONSTRUCTION OF LOW TEMPERATURE GEOTHERMAL RESOURCE WELLS AND BONDING (RULE 201).

01. General. Drillers constructing low temperature geothermal resource wells (bottom hole temperature more than eighty-five (85) Degrees F and less than two hundred twelve (212) Degrees F) shall be qualified under the Well Driller Licensing Rules. All low temperature geothermal resource wells shall be constructed in such a manner that the resource will be protected from waste due to lost artesian pressure and temperature. The owner or well driller is required to provide bottom hole temperature data, but the Director may make the final determination of bottom hole temperature, based upon information available to him. ()

a. All standards and guidelines for construction and abandonment of cold water wells shall apply to low temperature geothermal resource wells except as modified by Rule Subsections 030.03, 030.04, and 030.06. ()

b. A drilling prospectus shall be submitted to and approved by the Director prior to the construction, modification, deepening or abandonment of any low temperature geothermal resource well. The well owner and the well driller are responsible for the prospectus and subsequent well construction. ()

02. Well Owner Bonding. The owner of any low temperature geothermal resource well shall file a surety bond or cash bond as required by Section 42-233, Idaho Code, with the Director in an amount not less than five thousand dollars ($5,000) nor more than twenty thousand dollars ($20,000) payable to the Director prior to constructing, modifying or deepening the well after July 1, 1987. The bond amount shall be determined by the Director within the following guidelines. The bond shall be kept in force for one (1) year following completion of the well or until released in writing by the Director, whichever occurs first. ()

a. Any well less than three-hundred (300) feet deep with a bottom hole temperature of less than one hundred twenty (120) Degrees F and a shut-in pressure of less than ten (10) pounds per square inch gage (psig) at land surface shall maintain a bond of five thousand dollars ($5,000). ()

b. The owner of any well three hundred (300) feet to one thousand (1,000) feet deep with a bottom hole temperature of less than one hundred fifty (150) Degrees F and a shut-in pressure of less than fifty (50) psig at land surface shall maintain a bond of ten thousand dollars ($10,000). ()

c. The owner of any low temperature geothermal resource well not covered by Rules Subsections 030.02.a. and 030.02.b. shall maintain a bond of twenty thousand dollars ($20,000). ()

d. The Director may decrease or increase the bonds required if it is shown to his satisfaction that well construction or other conditions merit an increase or decrease. ()

e. The bond requirements of Section 42-233, Idaho Code, are applicable to wells authorized by water right permits or licenses having a priority date earlier than July 1, 1987, if the well authorized by the permit or license was not constructed prior to July 1, 1987 or if an existing well constructed within the terms of the permit or license is modified, deepened or enlarged on or after July 1, 1987. ()

03. Casing. Low temperature geothermal resource wells shall be protected from cooling by preventing intermingling with cold water aquifers and from loss of pressure by preventing flow into zones of lower pressure. ()

a. Casing which meets or exceeds the minimum specifications for permanent steel casing of Rule Subsection 035.02 shall be installed in every well. The Director may require a more rigid standard for collapse and burst strength as depths or pressures may dictate. Every low temperature geothermal resource well which flows at land surface shall have a minimum of forty (40) feet of conductor pipe set and cemented its entire length. ()

b. Casing shall be installed from twelve (12) inches above land surface into the overlying confining strata of the thermal aquifer. The casing schedule may consist of several different casing strings (i.e. conductor pipe, surface casing, intermediate casing, production pipe) which may all extend to land surface or may be overlapped and sealed or packed to prevent fluid migration out of the casing at any depth. ()

i. Low temperature geothermal resource wells less than one thousand (1,000) feet deep and which encounter a shut-in pressure of less than fifty (50) psig at land surface shall have two (2) strings of casing set and cemented to land surface. Conductor pipe shall be a minimum of forty (40) feet in length or ten percent (10%) of the total depth of the well whichever is greater. Surface casing shall extend into the confining stratum overlying the aquifer. ()

ii. Low temperature geothermal resource wells one thousand (1,000) feet or more in depth or which will likely encounter a shut-in pressure of fifty (50) psig or more at land surface require prior approval of the drilling plan by the Director and shall have three (3) strings of casing cemented their total length to land surface. Conductor pipe shall be a minimum length of forty (40) feet. Surface casing shall be a minimum of two hundred (200) feet in length or ten percent (10%) of the total depth of the well, whichever is greater. Intermediate casing shall extend into the confining stratum overlying the aquifer. ()

c. Rule Subsection 030.13.b. may be waived if it can be demonstrated to the Director through the lithology, electrical logs, geophysical logs, injectivity tests or other data that formations encountered below the last casing string set, will neither accept nor yield fluids at anticipated pressure to the borehole. ()

d. A nominal borehole size of two (2) inches in diameter larger than the Outside Diameter (O.D.) of the casing or casing coupler (whichever is larger) shall be drilled. All casing designations shall be by O.D. and wall thickness and shall be shown to meet a given specification of the American Petroleum Institute, the American Society for Testing and Materials, the American Water Works Association or the American National Standards Institute. The last string of casing set during drilling operations shall, at the Director's option, be flanged and capable of mounting a valve or blow out prevention equipment to control flows at the surface before drilling resumes. ()

04. Sealing of Casing. All casing shall be sealed its entire length with cement or a cement grout mixture unless waived by the Director. The seal material shall be placed from the bottom of the casing to land

surface either through the casing or tubing or by use of a tremie pipe. The cement or cement grout shall be undisturbed for a minimum of twenty-four (24) hours or as needed to allow adequate curing. ()

a. A caliper log may be run for determining the volume of cement to be placed with an additional twenty-five (25%) percent on site ready for mixing. If a caliper log is not run, an additional one hundred (100%) percent of the calculated volume of cement shall be on site ready for placement. ()

b. If there is no return of cement or cement grout at the surface after circulating all of the cement mixture on site, the Department will determine whether remedial work should be done to insure no migration of fluids around the well bore. ()

c. The use of additives such as bentonite, accelerators, retarders, lost circulation material shall follow manufacturer's specifications. ()

05. Blow Out Prevention Equipment. The Director may require the installation of gate valves or annular blow out prevention equipment to prevent the uncontrolled blow out of drilling mud and geothermal fluid. ()

06. Repair of Wells. The well driller shall submit a drilling prospectus to the Director for review and approval prior to the repair or modification of a low temperature geothermal resource well. ()

07. Abandoning of Wells. Proper abandonment of any low temperature geothermal resource well requires the following: ()

a. All cement plugs shall be pumped into the hole through drill pipe or tubing. () (See Figure 5, APPENDIX E, (located at the end of this chapter).

b. All open annuli shall be completely filled with cement. ()

c. A cement plug at least one hundred (100) feet in vertical depth shall be placed straddling (fifty (50) feet above and fifty (50) feet below) the zone where the casing or well bore meets the upper boundary of each ground water aquifer. ()

d. A minimum of one hundred (100) feet of cement shall be placed straddling each drive shoe or guide shoe on all casing including the bottom of the conductor pipe. ()

e. A surface plug of either cement grout or concrete shall be placed from at least fifty (50) feet below the top of the casing to the top of the casing. ()

f. A cement plug shall extend at least fifty (50) feet above and fifty (50) feet below the top of any liner installed in the well. The Director may waive this rule upon a showing of good cause. ()

g. Other abandonment procedures may be approved by the Director if the owner or operator can demonstrate that the low temperature geothermal resource, ground waters, and other natural resources will be protected. ()

h. Approval for abandonment of any low temperature geothermal well must be in writing by the Director prior to the beginning of any abandonment procedures. ()

202. -- 310. (RESERVED).

311. HEALTH STANDARDS FOR PUBLIC WATER SUPPLIES (RULE 311).
As noted under Construction of Cold Water Wells, the Well Driller is responsible for compliance with separation distance required by this rule, however compliance with these required separation distances does not exempt the driller from complying with any other separation distances and/or health standards has established by other authorized regulatory bodies, e.g. District Health Department, Idaho Department of Environmental Quality, etc". ()

312. SPECIAL STANDARDS FOR CONSTRUCTION OF WELLS WHEN MINERALIZED OR CONTAMINATED WATER IS ENCOUNTERED (RULE 312).

If, during the construction of a well, mineralized or contaminated water is encountered, the Well Driller shall take the appropriate steps necessary to prevent the poor quality waters from entering the well or moving up or down the annular space around the well casing. The method employed to case out this water shall be determined by the Well Driller, provided the minimum standards are met. The Well Driller will take special precautions to prevent water of inferior quality from moving vertically in the filter pack in a filter-pack well. All actions taken will be clearly documented on the Well Driller's report. ()

313. DISTANCES FROM CONTAMINATION SOURCES (RULE 313).

The Well Driller shall install every well in compliance with minimum setback distances from contamination sources established by the appropriate District Health Department and set forth in Idaho Department of Environmental Quality rules, set forth in IDAPA 58.01.03, "Individual/Subsurface Sewage Disposal Rules" and set forth in IDAPA 68.01.08, "Rules for Public Water Systems." ()

314. OWNERS RESPONSIBILITIES FOR WELL MAINTENANCE (RULE 314).

After a well is complete, the well owner shall: ()

01. Maintenance. ~~The well owner shall~~

a. N~~n~~ot allow modification to wells under their control without first obtaining an approved ~~said work being covered by an~~ IDWR ~~valid~~ permit, pursuant to I.C. §42-235; ()

b. Maintain the minimum casing height of eighteen (18) inches above land surface and finished grade;

c. Maintain the appropriate well cap, and control device if required, according to Rule 30.02.d;

02. New Construction. Prevent construction of a building or structure closer than ten (10) ft. from ~~the~~ an existing well; ()

03. Septic Tank Drainfields. Prohibit construction or installation of septic tank drainfields and areas designated for replacement drainfields ~~placed closer than~~ within one hundred (100) ft. ~~from~~ of an existing~~the~~ well; ()

a. Ensure that septic tanks are installed greater than fifty (50) ft. from ~~the~~an existing well; and ()

b. Ensure that septic tanks into which more than two thousand five hundred (2,500) gallons per day (gpd) of sewage are discharged are ~~installed greater~~ located more than three hundred (300) ft. from ~~the~~ an existing well. ()

04. Unusable Wells. The Well Owner shall abandon an unusable well in accordance with these rules within 24 months unless the Well Owner demonstrates that further modifications, development, or repair will cause the well to no longer be unusable*(??)*. ()

315. -- 320. (RESERVED).

321. AREAS OF DRILLING CONCERN (RULE 321).

01. General. ()

a. The Director may designate an "area of drilling concern" to protect public health, or to prevent waste and contamination of ground and/or surface water because of factors such as aquifer pressure, vertical depth to the aquifer, warm or hot ground water, or contaminated ground or surface waters. ()

b. The designation of an area of drilling concern does not supersede or preclude designation of part or all of an area as a Critical Ground Water Area (Section 42-233a, Idaho Code), Ground Water Management Area (Section 42-233b, Idaho Code), or Geothermal Resource Area (Sections 42-4002 and 42-4003, Idaho Code). ()

c. The designation of an area of drilling concern can include certain aquifers or portions thereof while excluding others. The area of drilling concern may include low temperature geothermal resources while not including the shallower cold ground water systems. ()

02. Bond Requirement. ()

a. The minimum bond to be filed by the well driller with the Director for the construction or modification of any well in an area of drilling concern shall be ten thousand dollars ($10,000) unless it can be shown to the satisfaction of the Director that a smaller bond is sufficient. ()

b. The Director may determine on a case-by-case basis if a larger bond is required based on the estimated cost to repair, complete or properly abandon a well. ()

03. Additional Requirements. ()

a. A driller shall demonstrate to the satisfaction of the Director that he has the experience and knowledge to adequately construct or abandon a well which encounters warm water or pressurized aquifers. ()

b. A driller shall demonstrate to the satisfaction of the Director that he has, or has immediate access to, specialized equipment or resources needed to adequately construct or abandon a well. ()

322. -- 324. (RESERVED).

325. DRILLING PERMIT REQUIREMENTS (RULE 325).

01. General Provisions. ()

a. The owner of a well to be constructed, drilled, deepened or enlarged on or after July 1, 1987 shall obtain a drilling permit from the Director prior to construction or drilling of the well. ()

b. The owner of a well under construction prior to July 1, 1987, for which the drilling equipment is at the site and construction is ongoing, shall not be required to obtain a drilling permit, provided that construction of the well was complete by August 1, 1987. The Director may extend the date for good cause. ()

c. The Director may issue a drilling permit to the owner of a proposed well, to the driller employed to construct the well, or to the owner's representative. ()

d. Drilling permits will not be issued for construction of a well which requires another separate approval from the department, such as a water right permit, transfer, amendment or injection well permit, until the other separate approval has been given by the department. The Director may grant a waiver if he determines that the public interest will be served by an expedited approval. ()

e. The Director may give verbal approval to a well driller for the construction of certain wells such as single family domestic wells and stockwater wells which do not require other separate approvals from the department, provided the driller files the drilling permit and appropriate fee with the Director within thirty (30) days of the verbal approval. ()

f. The Director may give verbal approval to a well driller for the construction of a well for which other permitting requirements have been met, provided the driller files the drilling permit and appropriate fee with the Director within thirty (30) days of the verbal approval. ()

g. The Director will not give a verbal approval for well construction or drilling in a designated area of drilling concern. ()

h. Failure of the driller to submit a completed drilling permit and fee within the thirty (30) day period after receiving verbal approval to construct a well is cause for the Director to seek the penalties provided by statute and by these rules. ()

i. After the effective date of these rules, a well driller shall not construct, drill or modify any well until a drilling permit has been issued or verbal approval is given. ()

02. Effect of a Permit. ()

a. A drilling permit authorizes the construction, drilling or modification of a well in compliance with the conditions of approval on the permit. ()

b. A drilling permit does not constitute a water right permit, injection well permit or other authorization which may be required from the department prior to actual well construction and does not authorize use of water from the well or discharge of fluids into the well. ()

c. A drilling permit may not be assigned from one (1) owner to another. ()

d. A drilling permit authorizes the construction of one (1) well (except group monitoring well drilling permits) unless other holes started under terms of the permit are properly abandoned and the department is advised of the abandonment. ()

03. Exclusions. ()

a. Geotechnical borings for the purpose of mineral exploration or for the design of foundations for structures or for the design of dams and embankments are not subject to the drilling permit requirement but shall be constructed and abandoned in accordance with minimum well construction standards. ()

b. The Director may require abandonment of wells constructed pursuant to Rule 045.03.a. if the wells are determined to cause waste or contamination of the ground water. ()

c. Wells constructed pursuant to Rule Subsection 045.03.a. shall be abandoned in compliance with adopted rules when use of the wells cease. ()

04. Fees. ()

a. A drilling permit fee is not required for a well constructed and completed prior to July 1, 1987, provided the well is not deepened or the dimensions of the well are not increased on or after July 1, 1987. ()

b. The drilling permit fee for construction of a well for a single family domestic use, stockwater use, class V(c) heat exchange ~~pump~~ injection associated with a single family domestic use or monitoring use or for any use with a rate of diversion of four one hundredth (0.04) cubic feet per second or less and for the storage of four (4) acre-feet per year or less shall be ten ($10) dollars. (See IDAPA 37.03.03, "Rules for Construction and Use of Injection Wells" for the description of class V(c) injection wells). ()

c. The Director may issue a blanket drilling permit for site specific monitoring programs prepared by a licensed engineer or licensed geologist as provided in Section 42-235, Idaho Code, upon submittal of a fifty dollar ($50) fee. ()

d. The drilling permit fee for well uses which are not included in Rules Subsections 045.04.b. and 045.04.c. shall be one hundred dollars ($100). ()

e. The difference between the drilling permit fee required by Rules Subsections 045.04.b. through 045.04.d., as applicable, shall be paid when an existing well constructed on or after July 1, 1987, for which the lower drilling permit fee was paid, is authorized by the Department for a use which would require the larger drilling permit fee. This rule applies even though the existing well is not deepened or the dimensions of the well are not increased. ()

f. A drilling permit fee will not be required for a new or additional use from an existing well constructed on or after July 1, 1987, when the drilling permit fee for the new or additional use is the same amount which was previously paid for construction of the well in connection with the existing use. ()

326. -- 998. (RESERVED).

999. PENALTIES (RULE 999).

A person owning or controlling a well that allows waste or contamination of the state's ground water resources or causes a well not to meet the construction standards provided in these rules, is subject to the civil penalties as provided by statute. A driller who violates the foregoing provisions of these minimum well construction standards rules is subject to the penalty provisions specified in Sections 42-238 and 42-238b, Idaho Code. ()

Appendices

- API: Grout Mixes, etc.
- ASTM: F 480, and others specs for casing, collapse strengths, etc.
- IDWR Flood Plain Maps Link (see Scott, only Ada County is currently properly geo-referenced to add to locator tool)
- Idaho Code, Title 42 and Title 67 Link
- Idaho Public Records Act (?)
- SDR/Schedules Rating Guides
- IDAPA 37.03.03 Injection well Rules
- IDAPA 58.01.08 Public Water Supply Rules